

### REMARKS

Reconsideration of the present application is respectfully requested.

#### Summary of Office Action

Claims 8-15, 17-27 and 37-38 stand rejected under 35 USC 103(a) based on Modiano et al., *Design and analysis of an asynchronous WDM local area network using a master/slave scheduler*, ("Modiano") in view of U.S. Patent no. 6,009,490 of Fukui et al. ("Fukui") and U.S. Patent no. 5,845,152 of Anderson et al. ("Anderson").

Claims 29-30 stand rejected under 35 USC 103(a) based on Modiano in view of Fukui and Anderson and further in view of U.S. Patent no. 5,892,916 of Gehlhaar et al. ("Gehlhaar").

Claim 35 stands rejected under 35 USC 103(a) based on Modiano in view of Fukui and Anderson and Gehlhaar, and further in view of Weik *Fiber Optics Standard Dictionary, 3rd ed.* ("Weik").

#### Summary of Amendments

In this response, claims 8, 23, 28, 29 and 37 have been amended, and claims 40-49 are newly added. No new matter has been added.

In response to the Office's withdrawal of the indicated allowability of claims 8-15, 17-30, 35, 37 and 38, Applicants have reinstated previously canceled claims 31-33, 36

and 39 (reintroduced above as claims 44-48, respectively), since those claims were canceled only for purposes of expediting allowance and issuance.

### Discussion of Rejections

Applicants respectfully traverse the rejections. The amendments to the claims are made only to place the claims in a form which Applicants prefer. The amendments are not made in response to the rejections or to comply with any statutory requirement of patentability, since no such amendments are believed to be necessary. The independent claims prior to this amendment each included (and still include) one or more limitations that are not disclosed in the cited art, as discussed below.

### Claim 40 (New)

Claim 40 recites:

40. (New) A method comprising:  
    using a scheduler in a headend of an optical wavelength division multiplexed (WDM) network to schedule **asynchronous, unslotted, tokenless communication** between a plurality of nodes on the WDM network, said communication being performed over a data channel of the WDM network;  
    using the scheduler to control transmissions from each of the plurality of nodes to the scheduler, **so that the transmissions from each of the plurality of nodes to the scheduler are collision-free, wherein the plurality of nodes do not make reservations to gain access to the data channel;** and  
    transmitting data from a first node of the plurality of nodes to a second node of the plurality of nodes on a data channel of the WDM

network, based on a scheduling message from the scheduler. (Emphasis added.)

The cited references, either individually or in combination, do not disclose or even suggest such a method. In particular, the cited combination does not disclose or suggest asynchronous, unslotted, tokenless communications in a WDM network, with collision-free transmission from the various nodes to a scheduler, where the nodes do not make reservations to gain access to a data channel. Although Applicants' arguments are directed to the cited combination of references, it is necessary to consider the references' individual disclosures, in order to ascertain what combination, if any, could be made from them.

Modiano does disclose an optical WDM network for communication between nodes. However, Modiano explicitly teaches contention-based communications from individual nodes to the scheduler, which results in collisions between different nodes' transmissions on the control channel. Modiano, p. 901, left column, 2nd complete paragraph, last sentence; p. 902, right column, 2nd complete paragraph. By teaching a contention-based (collision-based) system for communicating from nodes to the scheduler, therefore, Modiano explicitly teaches away from the present invention as recited in claim 40. For at least this reason, the cited combination cannot and does not render the invention of claim 40 obvious.

Furthermore, Modiano teaches a reservation-based system, i.e. a system in which nodes send reservation requests to the scheduler, to request access to the data channel. Modiano, p. 902, right column, 1st and 2nd complete paragraphs. That is in direct contrast to claim 40, which specifies that the nodes do not make reservations to gain access to the data channel. Therefore, Modiano explicitly teaches away from the invention of claim 40 for this additional reason.

These contrary teachings of Modiano cannot be and are not remedied by any disclosure in the other cited references. For the above reasons, therefore, the invention as recited in claim 40 is not obvious based on the cited references, either individually or in combination.

#### Claim 8

Claim 8 recites:

8. (Currently amended) A method to implement a medium access control (MAC) protocol for a local-area optical wavelength division multiplexed (WDM) network, the method comprising:
- controlling inter-node communication on the WDM network by transmitting a first control packet over a control channel of the WDM network, the WDM network including a scheduler, a data channel, and a plurality of nodes, each of the plurality of nodes coupled to the control channel and the data channel, the first control packet specifying a first one of the plurality of nodes in the network as a source node, a second one of the plurality of nodes in the network as a destination node, **a value which corresponds to an amount of information which the source node can transmit, and a preview of a second control packet;** and
  - after transmitting the first control packet, waiting a predetermined period of time related to the value specified in the first control packet.
- (Emphasis added.)

The Office acknowledges that Modiano does not disclose:

1) a value which corresponds to an amount of information which the source node can transmit;

2) the control message is a packet; or

3) the first control packet specifies a preview of the second control packet.

Office Action, pages 3-4.

However, the Office contends that Fukui discloses feature 1) and Anderson discloses feature 3), and that it would be obvious to combine the teachings of these references to produce the invention (feature "2)" is moot for purposes of this discussion).

Applicants respectfully traverse.

In relation to feature 1), the Office cites Fukui as teaching a "number of transfer bytes" in figure 9, and contends:

At the time the invention was made, it would have been obvious . . . to include such a value in the control message of Modiano. One of ordinary skill in the art would have been motivated to do this for the intuitively practical consideration of the length of the transmission. . . . That is, the method of Modiano involves each node transmitting within the limitations of a slot. **If the transmitting node does not know when to and transmitting, this node's transmissions may overlap, or "collide", in the next slot with a scheduled transmissions of another node.** Office Action, page 3 (emphasis added).

Applicants respectfully submit that the Office's above-quoted rationale is in error. With slotted communications, each node inherently understands the meaning of a slot and knows the boundaries of a slot, and those boundaries define the limits of a data transmission, independent of the amount of data to be transmitted. In a slotted system such as Modiano, there is no need for any additional mechanism to avoid collisions, such as a length of data limit as alleged by the Office. (Note that while Modiano discloses a slotted system for data communication, access to the control channel in Modiano is through an unslotted protocol. Modiano, p. 901, left column, 2nd complete paragraph, last sentence. However, the control channel also has no need for a length of data limit, because it is designed to be tolerant of collisions.) For at least this reason, Fukui does not remedy the admitted deficiency of Modiano in regard to feature 1). For at least this reason, therefore, the invention of claim 8 would not be obvious based on any combination of the cited references.

In relation to feature 3), the Office cites Anderson's disclosure of "a link to a descriptor block for the packet that is to follow it" in column 4, lines 9-12. However, there are at least two significant differences which the Office overlooks. First, a DMA descriptor block is not something that is transmitted from a source node to a receiving node, during a DMA transfer or otherwise. It is a unit of metadata used by the DMA controller to identify and locate the actual data to be transferred. This is in contrast with

claim 8, which recites that the first control packet, which is transmitted on the network, includes a preview of a second control packet.

Second, a "link" in a packet to the DMA descriptor of the next packet, as disclosed in Anderson (which is a common DMA technique), is just a reference used to locate the DMA descriptor block of the next packet; it is not a preview of the next packet (in fact, it is not even a preview of the DMA descriptor block of the next packet). The plain meaning of the term "preview" is that it conveys some indication of the content of whatever it is a preview of. In contrast, a "link" as disclosed in Anderson is only used to locate the packet and does not give any information about its content.

For at least these reasons, therefore, Anderson does not remedy the admitted deficiency of Modiano in regard to feature 3).

For the above reasons, therefore, the invention as recited in claim 8 would not be obvious based on the cited references, either individually or in combination.

### Claim 23

Claim 23 recites "each of the control messages including a preview of a next control message." For reasons similar to those discussed above regarding claim 8 (regarding the "preview" limitation), therefore, the invention as recited in claim 23 also would not be obvious based on the cited art.

### Claim 28

Claim 28 recites "the second control packet including a first value corresponding to an amount of information which the one of the plurality of nodes can transmit, and a preview of a third control packet" (emphasis added). For reasons similar to those discussed above regarding claim 8, therefore, the invention as recited in claim 28 also would not be obvious based on the cited art.

Additionally, claim 28 as amended recites that the scheduler is in the only node that transmits on the control channel. Modiano expressly teaches away from this, by teaching that all of the nodes communicate on the control channel, e.g., for purposes of making reservations. Modiano, p. 902, right column, 1st and 2nd complete paragraphs. For this additional reason, therefore, the invention as recited in claim 28 would not be obvious based on the cited art.

#### Claim 37

Claim 37 recites "the first control packet specifying . . . a value which corresponds to an amount of information which the source node can transmit, and a preview of a second control packet" (emphasis added). For reasons similar to those discussed above regarding claim 8, therefore, the invention as recited in claim 37 also would not be obvious based on the cited art.

Additionally, claim 37 essentially recites that in response to a packet specifying communication between a first node and a second node, a third node retrieves a packet, and the third node subsequently transmit that packet in response to a



subsequent packet. There is no disclosure or suggestions in any of the cited references, either individually or in combination, that one node (e.g., "third node") can retrieve a packet for transmission in response to receiving a packet that specifies communication between two other nodes (e.g., first and second nodes), as essentially recited in claim 37. For this additional reason, therefore, the invention as recited in claim 37 would not be obvious based on the cited art.

Claim 44 (formerly claim 31, which is now canceled)

Claim 44 recites "the first control packet includes . . . a value which corresponds to an amount of information which the source node can transmit." For reasons similar to those discussed above regarding claim 8, therefore, the invention as recited in claim 44 also would not be obvious based on the cited art.

Additionally, claim 44 recites using the scheduler to schedule and provision for feedback from the plurality of nodes to the scheduler. In previously rejecting claim 31, the Office acknowledged that Tomioka does not disclose this limitation, but contended that Gehlhaar provides this teaching, and that it would be obvious to combine Tomioka with Gehlhaar (Office Action mailed 9/3/2008). However, Gehlhaar does not relate to WDM networks. In WDM networks, slotting and contention traditionally have been the two alternative ways by which nodes would access a control channel to communicate with a scheduler (as shown in Modiano, which uses contention)(see Applicant's

specification at page 1, lines 18-27). It would not be obvious, in a WDM network, to use the scheduler to schedule transmissions from other nodes to the scheduler itself, regardless of Gehlhaar's disclosure which is at best only tangentially relevant. For at least this additional reason, therefore, the invention of claim 44 would not be obvious based on any combination of the cited references.

Applicants have not necessarily discussed here every reason why every pending independent claim is patentable over the cited art; nonetheless, Applicants are not waiving any argument regarding any such reason or reasons. Applicants reserve the right to raise any such additional argument(s) during the future prosecution of this application, if Applicants deem it necessary or appropriate to do so.

#### Dependent Claims

In view of the above remarks, a specific discussion of the dependent claims is considered to be unnecessary, as they are patentable at least by virtue of their dependency on a patentable independent claim. Therefore, Applicants' silence regarding any dependent claim is not to be interpreted as agreement with, or acquiescence to, the rejection of such claim or as waiving any argument regarding that claim.

Conclusion

For the foregoing reasons, the present application is believed to be in condition for allowance, and such action is earnestly requested.

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Respectfully submitted,

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